Structure and phase transitions in several metal-organic framework glass formers

An invited talk

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Metal-organic frameworks (MOFs) are microporous inorganic-organic hybrid materials constructed by metallic nodes and their organic ligands. In 2015, some of MOFs were found to be excellent glass formers. The melt-quenched MOF glasses are an emerging family of glasses, in which the coordination bonds constitute the structural skeleton. In the present talk, I first review recent advances in investigating the structure, phase transitions, and glass formation in some of Zeolitic Imidazolate Frameworks (ZIFs) (a subset of MOFs) during dynamic heating, isothermal treatement and quenching. I then describe possible mechanism for glass formation of some ZIFs, and the origin of the ultrahigh glass forming ability of those ZIFs. I finally report on recent progress in discovering possible functionalities of the melt-quenched ZIF glasses. In addition, I point out some major challenges and perspectives concerning future research of MOF glasses.